MAINE DEPARTMENT OF TRANSPORTATION

2002 PROGRESS REPORT ON IMPLEMENTATION OF THE STORMWATER MEMORANDUM OF AGREEMENT

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This is the fifth Progress Report since implementation of the Stormwater Memorandum of Agreement (MOA) in 1998. This report includes current information on compliance with both the stormwater quality and stormwater quantity sections of the MOA, updates on various Departmental programs and new data on previously installed BMPs.

In 2003 the MOA will be modified to include the requirements of the Maine Pollutant Discharge Elimination System (MPDS) General Permit for Construction Activity pursuant to 06-096 CMR 529(2)(a)(2)(i). The 2003 report will include additional information and data as necessary to satisfy these new requirements.

ACTIVITIES ACCOMPLISHED

Training

The Maine Department of Transportation (MDOT) continues to provide technical assistance to the Department of Environmental Protection's (DEP) Nonpoint Source Program (NPS). Representatives from the Environmental Office participated in the Basic and Advanced Erosion and Sediment Control Practices for Contractors, the Erosion Control Training for Experienced Construction Company Personnel and also the Training for Salmon Watershed Council Volunteers. There was a total of 13 sessions that MDOT participated in, providing over 80 hours of assistance.

In-house erosion and sediment control training is on a rotating schedule for Highway Maintenance and Bridge Maintenance personnel. Last year the training targeted Bridge Maintenance managers; this year the training was focused on Highway Maintenance supervisors, emphasizing the need to complete an erosion control plan for each activity involving soil disturbance and to coordinate environmental issues through the Regional Program's Division Environmental Coordinators. The Environmental Coordinators also provided in-house and field training for all their crew supervisors who are actually responsible for writing the plan. In 2003 the training will focus on Bridge Maintenance personnel once again and will address cofferdam installation issues and the submission of erosion and sediment control plans.

Training was provided to Town officials and their consultants and contractors who work on locally-administered projects. These are projects that are funded by MDOT, but are administered by the Towns. The Department's contract with the Town specifies that the project's construction activities must be in compliance with the MDOT BMP Manual. Three training sessions were held, one each in Bangor, Augusta and Portland. The topics covered environmental permitting and permit-by-rule requirements and information on the BMP Manual.

Many of the Environmental Office staff participated in a Geofluvial Morphology workshop sponsored by a multi-agency work group. Deane Van Dusen represents the MDOT on this work group. The workshop was held in June, with 2 days of seminars and one day in the field. A few of the staff also attended a more in-depth weeklong workshop held in the fall. The workshops presented a new way of looking at stream erosion and sedimentation processes, which has already proved helpful in project design reviews and will provide guidance for two future stream

restoration/wetland mitigation projects planned for 2003. The work group has more training planned for 2003.

Other training sponsored by the Department included a 2-day Fish Passage work shop on providing and restoring fish passage on transportation projects, targeted to MDOT designers and other state agencies, and a conference on turf-reinforced matting in the spring of 2002.

Environmental Office

Surface Water Resources Unit (SWRU). The staff of the SWRU provided their expertise on over 140 different projects this year. The staff continues to participate in the team process, reviewing project designs and making recommendations for implementation of BMPs that will improve stormwater quality, manage stormwater runoff or provide long-term protection against erosion. Special attention is given to implementing permanent BMPs on projects located in watersheds identified as Most At Risk from Development or on the Priority list, and in Atlantic Salmon watersheds.

Temporary BMPs used during construction are the responsibility of the Contractor, but the SWRU reviews the temporary erosion control plan for completeness and performs the all-important field reviews to check for compliance with that plan and with the MDOT BMP Manual.

The staff also makes an assessment of each project to determine whether the stormwater quantity section of the MOA will need to be addressed. If the stormwater quantity section is triggered, the project team is notified of the requirements under that section, and the necessary peak flow analysis is coordinated through the Hydrology Unit. In 2003 the MOA will incorporate language to include the standards and practices that MDOT and MTA utilize to comply with the requirements of the Construction General Permit under the National Pollution Discharge Eliminations Systems, Phase II (NPDESII).

Three Division Environmental Coordinators have been hired to work for the Regional Program in close coordination with the SWRU. They provide technical assistance within each of the Maintenance & Operations Divisions. The Coordinators are responsible for project permitting and compliance with the Stormwater MOA. Their responsibilities and accomplishments are described further in the Regional Program section below.

Hydrology Unit. The Unit provides assistance on individual projects when the stormwater quantity section of the MOA is triggered. In-house training of staff continues on an as-needed basis. This year the Drainage Design Manual was completed and delivered to highway designers and consultants. Highlights of the manual include conversion to metric system and updating of hydrologic methods. In support of the new manual, Excel worksheets were developed to automate many of the most common hydrologic calculations.

The unit also spent considerable time in the development of the Fish Passage Policy and Design Guide, with follow-up training as previously described.

A continuing responsibility of the Hydrology Unit is to maintain and update hydrologic methods and data. MDOT contracts annually with the U.S. Geological Survey to maintain 10 stream gauging stations. In addition, MDOT also cooperates with the USGS on projects of mutual interest. Recently completed was a study of the effects of suburbanization on hydrologic response. This year MDOT is a major contributor to a study of low flows in Maine. MDOT's specific interest pertains to fish passage flow requirements but the final report will benefit a wide variety of activities, including planning, agriculture, water supply, and water quality permitting. A small watershed study is currently nearing completion and serious consideration is being given to continuing data collection so that ultimately reliable peak flow regression equations can be developed. Similarly, application for funding has been made to the New England Transportation Consortium for a steep watershed peak flow statistical analysis. If granted, these two projects will complete the work initiated with the 1999 updating of peak flow equations and give Maine a full suite of tools for estimating peak flows in the most commonly encountered undeveloped watersheds.

Environmental Management Systems (EMS). During 2002, 55 Maintenance facilities were audited for a variety of environmental standards including erosion control and stormwater runoff. This year, audit teams also performed spot checks of maintenance projects along highways. Next year, third party audits of the facilities will be completed. An EMS was completed for the State Ferry Service and all of its facilities were internally audited this summer. An EMS was also completed for the MDOT Testing and Chemistry labs this year. An internal team audited all labs in the fall.

Surface Water Quality Protection Program (SWQPP). This program funds improvement projects to address water quality impacts from state highways. Three projects were built in 2002, as described below. The Program is gearing up for a busy year in 2003; nine projects are slated for construction.

Project	Location, Watershed	Improvements
7765.07 Bridgton	Rt. 107, Adams Pond	winter sand removal, paved shoulders, 1 sediment trap and 3 plunge pools installed. 1 level spreader and 1 ditch turn-out installed.
7765.12 Haynesville	Ferry Road, Mattawamkeag River	riprap downspout installed.
9662.03 Lincolnville	Rt. 52, Ducktrap River	stabilized back slope with riprap, stone-lined ditch, checkdam & plunge pool installed.

Atlantic Salmon Improvements. MDOT continues to coordinate with the Watershed Councils and other interested parties in pursuit of Atlantic Salmon habitat improvements. Peter Newkirk,

Supervisor of the SWRU, serves as a council member on the Sheepscot River Watershed Council and also attended the Project Share field trip to look at potential improvement projects on Rt. 9. Ryan Annis, SWRU staff member, is on the multi-agency Work Group that formed in 2002 to develop a BMP Manual specifically geared toward roads within Atlantic Salmon watersheds.

This year, the following Maintenance projects were completed in Salmon watersheds:

1) In the Ducktrap River watershed, the Division 5 maintenance crews made improvements to Rt. 52 in Lincolnville consisting of stone ditch protection and 2 sediment traps. These measures were in addition to the project completed under the SWQP Program noted above.

2) In the Sheepscot River watershed, maintenance crews installed stone ditch protection and 1sediment trap on Rt. 218 in Whitefield and Alna.

In addition, there were 3 construction projects built within Atlantic Salmon watersheds in 2002. BMPs for these projects are listed in Tables 1 and 3.

10202.00Milbridge-HarringtonRt. 1 highway improvements
10210.00Whitefield- JeffersonRt. 126 highway improvements
9209.00NewcastleRt. 215 highway improvements

Project Development

Environmental Specifications. The Standard Specification 656, Temporary Soil Erosion and Water Pollution Control, along with its sister document, the project-specific Special Provision 656, are still being used with great success. These documents require the Contractor to submit a temporary Erosion and Pollution Control Plan for Department approval prior to any work involving soil disturbance. They have been valuable tools for managing potential stormwater impacts off construction sites.

The MDOT BMP Manual, last revised in January of 2000, will be reviewed and updated during the winter of 2003. The work will be managed by the SWRU in cooperation with other Departmental units and the DEP.

Regional Program. This program is responsible for development of collector highway reconstruction, pavement preservation (overlays) and large culvert replacements (STRUTs). The Regional Program was on the fast track during 2002 with over 80 projects completed. The projects varied from overlays with minimal environmental impacts to major reconstruction jobs with extensive environmental issues. The three Division Environmental Coordinators were responsible for providing technical assistance on a wide range of environmental issues (including stormwater quality and quantity) and for obtaining the appropriate environmental permits for these projects. They also reviewed the erosion control plans and performed field inspections. They were extremely busy and their efforts have been invaluable to the success of these projects. Permanent BMPs associated with projects in the Regional Program are shown in Table 1. There were no Regional projects that triggered the Stormwater Quantity section of the Stormwater MOA.

Urban-Arterial, Bridge, Traffic and Multi-Modal Projects. This year one project triggered the peak flow analysis under the stormwater quantity section of the MOA, the Augusta "Third Bridge" (pin 556.20). This project is currently under construction. The design includes a new I-95 interchange and 3 mile connector, for a total of roughly 11 acres of new impervious area within the Kennebec River watershed. The final drainage report specifies that drainage pathways will not be changed, that the peak flow to Stone Brook will be reduced by downsizing a culvert under the new I-95 ramp, and that stormwater will be treated in a new sediment trap/detention pond.

Although a total of five projects have triggered the peak flow analysis since the signing of the MOA in 1998, none of these have been located within a lake watershed (see below).

pin	Town	Watershed	New Impervious Area in acres	Treatment
4926.00	Bangor	Penobscot River	3.7	detention basin
5591.00	Amherst	Middle Br. Union R.	7.0	downsize culvert
7787.10	Gorham	Presumpscot River	1.0	none needed
7787.20	Gorham	Presumpscot River	2.3	none needed
556.20	Augusta	Kennebec River	11.0	downsize culvert

Several projects that are being currently developed may need to address stormwater quantity in 2003 (see Table 2).

Table 3 shows the permanent BMPs that were installed on projects built in 2002. An inventory of all permanent BMPs that have been installed since record keeping began in 1998 was developed in 2001 and is available upon request. This inventory will continue to be updated yearly. The 2002 update shows that currently over 220 sediment traps and 100 plunge pools have been built. In addition, the Department has installed 16 vegetated swales, 13 detention ponds, one wet pond and 5 engineered stormwater systems.

This winter each Maintenance & Operations Division office will receive an inventory of the BMPs that have been installed in their Division since 1998 in order to help them keep track of their inspection and maintenance requirements. The number of BMPs the Department is installing continues to grow, as does the responsibility for upkeep and maintenance.

Maintenance and Operations

Projects. The Maintenance crews continue to use the check-off form, as revised in 2001, for their Erosion Control Plan. This year over 450 projects were reported to the Surface Water Resources Unit (718 last year). The most common maintenance activities continue to be ditching and culvert installation or repair. Shoulder grading, guardrail installation or repair, and

catch basin installations are some of the other activities accomplished this year. Repair of washouts totaled .8 acres for 2002 (down from 3 acres in 2001, possibly due in part to the drought).

Table 4 shows the variety of BMPs used on maintenance projects this year. The most critical BMP for both the temporary and permanent stabilization of ditches is the temporary erosion control blanket. Division 6 (Scarborough) is the most improved in terms of its increased usage of blanket (the blanket was used on 61% of Division 6 jobs in 2002, compared to 27% in 2001). Division 2 (Ellsworth) also increased their usage of the blanket by almost 25% (from 4% in 2001 to 28.9% in 2002).

Post Construction Inspection and Maintenance. A goal of the SWRU for 2002 was to inspect all the sediment traps and vegetated swales that had been installed in or prior to 1999 to determine whether the traps were correctly installed and functioning. The sediment traps and vegetated swales were targeted because of their more pressing maintenance requirements. Approximately 68 traps and 2 vegetated swales were inspected over the course of several months. Only one of the BMPs was incorrectly installed (a vegetated swale in Portland was built with a riprap bottom). About 14 of the 68 sediment traps were full of sediment and needed maintenance. In each case the appropriate Town Manager or Division Maintenance Supervisor was contacted and a clean-out was requested. A few of the traps were empty, some because they are located in an area that does not receive much runoff, and others because the sediments washed into the large void spaces of the riprap lining. Several traps that were installed are in contact with groundwater and have become more like ponds, with cattails and other wetland vegetation (Rt. 9, Aurora- Osborn area).

The Surface Water Resources Unit will continue these BMP inspections and in 2003 will visit over 50 sediment traps, about 8 vegetated swales, and 3 detention ponds, all built in either 2000 or 2001. The inspection schedule will then continue on a 2-year rotation, so that all BMPs inspected this year will again be inspected in 2004, along with the new BMPs built in 2002.

BMP Sampling and Data Analysis. About half of the BMPs inspected had enough sediment accumulation in them to be sampled and analyzed for particle size content. One composite sample was taken from each of 39 sediment traps, 2 vegetated swales and the Bridgton wetpond.

The results of the particle size analysis (see Table 5) indicate that, as expected, mainly larger sized particles (very coarse, coarse and medium sizes) are being captured in sediment traps. The exception to this is several samples from the ponded sediment traps on Rt. 9 in Aurora -Osborn. These samples contain a higher percentage of fines than in other sediment traps. Also, the sample from the vegetated swale in Hermon contained relatively more fines than the sediment traps. The particles in the sample from the Portland vegetated swale, which was improperly installed, are generally larger and similar to the sediment trap data.

The Bridgton wet pond sample was taken from the forebay, which was designed to capture larger particles and needs more frequent cleanout, resulting in less maintenance of the pond basin itself (which would involve dewatering the pond). This sample showed a

predominance of coarse particles as expected. The maintenance supervisor stated that the forebay had been cleaned out on two other occasions previous to this fall. Two winter sand stockpiles were also sampled for a reference and had larger particle sizes as expected (70% of their content was coarse or larger-sized particles).

Next year, the SWRU plans to look at sediment gradations from more sediment traps and several vegetated swales and detention basins for guidance in the future design applications of these BMPs. The SWRU is also interested in how the Salt Priority Program may influence our choices of BMPs in the future. The Salt Priority Program uses salt as the primary deicer and minimizes the use of sand.

CONCLUSION

The intent of the Stormwater MOA is to ensure that the Department achieves stormwater quality and quantity control measures consistent with the standards of the Chapter 500 Stormwater Rules. On average, the Department is building one project per year that would have otherwise required a permit under the Stormwater. The installation of both temporary and permanent BMPs has improved stormwater management and treatment throughout the state rather than on just one project. Training, contract specifications, team processes, monitoring and other strategies are in place and will continue to evolve as necessary to meet the requirements of the Stormwater MOA in the future.

Table 1. BMPs incorporated into Regional Program projects during the 2002 field season.

pin #	Town	sed. Trap	ditch t.o.	level spr.	downspout	veg. Swale	detention pd	apron	slope stabiliz	ditch block	hill diversion	plunge pool	filter berm	CB or tank	Other
9155.00	Auburn							1			1		1		
10617.00	Augusta/Belgrade														1
10655.00	Baldwin		2	1		2									
10208.00	Belgrade- Oakland		1												
10293.00	Biddeford							1							
9785.00	Blue Hill		3												
9783.00	Buxton										2				
10299.00	Chain of Ponds		1										2		
10658.00	Cornish/Kezar Falls					4		2							
10657.00	Dayton/Lyman		1					5					2	6	
9186.00	Durham		2			4		5		1			2		
9158.00	Freeport		2										3		
9159.00	Gorham					2		3			4		2		
10662.00	Gorham/Standish			2		2									
7420.00	Gray		1	2							4				
10778.00	Greenbush									1					
9580.00	Hiram						2								
9181.00	Jay-Farmington		1							1	2				
9180.00	Jay-Chesterville							2							
10209.00	Manchester		1												
10668.00	Mechanic Falls		3	4		6		5		1					
9778.00	Otisfield			3	3	3	1			1			2		
9294.00	Parsonsfield							1							
10670.00	Poland/Mech Falls		2			4									
9565.00	Poland									4			2		
9787.00	Rumford		1	2		2		1							
10713.00	Rumford/Peru							2							
10715.00	Rumford							2							
9210.00	Sedgwick		2												
10806.00	Stow			3		3									

10718.00	Turner				3			1							
10719.00	Turner				1			1							
10303.00	Weld							1							
10681.00	Wells									2			3		
10217.00	W.Paris-Hartford	6	2		8			7	1			2			
10210.00	Whitefield -Jefferson	1													
8907.00	Windham				2			2		4					
10285.00	Winn				6										6*
	Totals	**30**	**19**	**3**	**52**	**2**	**1**	**42**	**10**	**19**	**0**	**18**	**9**	**1**	**6**

* permanent checkdams

Table 2. Projects currently being developed that may exceed Stormwater Quantity Thresholds.

Augusta- Manchester	4270.10	Rt. 202- Planning stage
Biddeford	7492.10	Rt. 111- drainage analysis underway
Dedham -Ellsworth	4327.10	Rt. 1A- preliminary plan stage
Easton	8852.00	New Highway- preliminary plan stage
Falmouth	9188.00	Rts. 26/100, preliminary
Madison	9196.00	Rt. 201- preliminary
New Gloucester -Poland	3517.20	Rt. 26- finalizing plans
Saco- Buxton	9493.00	Rt. 112, preliminary
South Portland	8822.00	Western Avenue, preliminary
Windham	10214.00	Rt. 115, preliminary
Windham	2850.10	Rt. 302, finalizing plans
Woolwich	8846.00	Rt. 1- on holdas of 11/17/00

Table 3. BMPs incorporated into other projects constructed during the 2002 field season.

pin #	Town	sed. Trap	ditch t.o.	level spr.	downspout	veg. Swale	detention pd	apron	slope stabiliz	ditch block	hill diversion	plunge pool	filter berm	CB or tank	Other
8815.00	Auburn					1									
10056.00	Bar Harbor														1*
	Calais Branch RR									1					
4348.20	Frenchville					1			4						2**
6719.00	Fryeburg								2						
8723.00	Gorham		3						2						
9507.00	Gray							1							
9390.00	Hollis		1			4			2	1					
2852.10	Kennebunk					1			2				2		1**
7735.00	Lewiston					2									
7736.00	Lewiston					2									
4217.10	Limerick		1						5	1				2	
9586.00	Mayfield		1												
8471.10	Monmouth			3	1	3								4	
4337.21	Moscow- Caratunk					4									
9209.00	Newcastle					2								3	
8929.00	New Gloucester									2					
8474.00	Old Orchard Beach					2									
9048.00	Poland									4					6**
6704.00	Portland														1***
10196.00	Rumford			1					1						3**
5741.00	Skowhegan		1	1											
8943.00	So. Berwick					1									
8918.00	Turner					2									
10168.00	Waterboro								1						
7855.10	Windham- Standish								6	X			4	12	
4259.00	Yarmouth		1						10						

Totals	**8**	**5**	**1**	**24**	**0**	**1**	**35**	**9X**	**0**	**0**	**6**	**12**	**9**	**14**

X= woodwaste used throughout 3 mile project

* fish passage measures ** permanent checkdam *** engineered system

Table 4. Use of BMPs on maintenance projects as a percentage of total reports submitted.

Div. #	Hand seed/mulch	hydroseed	silt fence	woodwaste	checkdam	riprap ditch	EC blanket	sed. trap	diversion	ditch turnout	downspout	apron	plunge pool	inlet/outlet prot	riprap slope
1	100.0	28.3	17.4	0.0	30.4	2.2	54.3	0.0	0.0	0.0	0.0	0.0	0.0	13	6.5
2	97.4	26.3	14.5	1.3	0.0	10.5	28.9	7.9	7.9	1.3	2.6	0.0	0.0	13.2	3.9
3	82.0	1.6	0.0	0.0	16.4	18.0	55.7	3.3	3.3	0.0	14.7	14.7	0.0	26.2	23
4	94.0	9.4	12.5	3.1	6.3	9.4	43.8	25.0	0.0	9.4	3.1	3.1	25.0	15.6	3.1
5	75.7	0.0	1.4	1.4	1.4	10.0	30.0	4.3	0.0	1.4	2.9	2.9	5.7	17.1	7.1
6	93.2	22.7	4.5	0.0	6.8	6.8	61.4	2.3	5.6	6.8	0.0	4.5	2.8	9.1	0
7	90.7	0.0	9.3	9.3	1.9	6.5	21.5	1.9	1.9	2.8	2.8	1.9	2.8	8.4	2.8

Table 5. Particle size analysis as a percentage of the total sample.

SEDIMENT TRAPS

Sample #	Gravel	Very Coarse	Coarse	Medium	Fine	Very Fine	Silts/Clays
126502	12.8	12.3	29.2	18.8	12.6	8.2	6.1
126503	7.2	16.3	25.8	18.1	13.4	9.5	9.7
126504	17.0	19.5	26.1	15.7	9.7	5.7	6.3
126505	5.3	17.0	34.1	20.9	10.6	6.8	5.3
126506	27.6	22.4	27.1	11.1	5.9	3.2	2.7
126507	17.0	18.6	34.0	17.7	7.0	3.5	2.2
126508	6.2	21.8	35.3	19.1	9.7	5.2	2.7
126509	26.2	25.8	31.4	12.0	2.5	0.8	1.3
126511	9.1	18.4	19.1	13.5	11.6	7.8	20.5
126512	3.7	17.1	47.8	20.8	6.0	2.1	2.5
126513	11.4	24.1	37.7	16.1	6.4	2.2	2.1
126514	8.1	22.7	29.1	15.5	6.2	5.1	13.3
126516	32.9	26.8	22.2	8.8	4.1	2.4	2.8
126517	32.5	28.6	19.0	8.7	4.1	2.4	4.7
126518	31.8	17.9	11.1	6.3	5.1	5.4	22.4
126519	19.7	18.9	11.5	5.9	4.1	5.0	34.9
126520	32.1	29.9	15.1	5.8	3.1	3.6	10.4
126521	16.8	10.2	8.9	5.1	3.7	3.9	51.4
126522	18.2	7.7	4.2	2.7	3.6	6.7	56.9
126523	9.5	4.6	4.9	4.0	5.4	8.1	63.5
126524	24.8	14.5	11.7	8.8	7.3	8.2	24.7
126525	29.8	28.5	21.3	10.9	4.6	2.1	2.8
126526	20.0	39.3	26.4	8.8	3.3	1.1	1.1
126527	26.3	23.9	21.0	9.0	3.9	2.5	13.4
126528	8.4	31.4	42.8	13.3	2.2	0.6	1.3
126529	12.2	29.8	30.0	15.1	7.3	3.7	1.9
126530	19.0	25.4	23.0	13.6	8.8	6.0	4.2
126531	15.5	27.8	27.9	13.8	9.0	4.1	1.9
126532	20.9	36.5	25.5	10.4	3.7	1.8	1.2
126533	14.9	26.5	35.9	13.8	5.4	2.1	1.4
126534	4.9	13.0	23.9	16.9	12.7	8.5	20.1

126536	25.1	16.6	31.1	16.1	7.5	2.5	1.1
128426	44.7	28.3	15.2	5.9	2.4	1.2	2.3
128427	35.1	26.4	19.5	7.2	4.2	3.9	3.7
128428	23.5	25.5	18.3	11.3	7.0	5.2	9.2
128430	37.4	16.7	18.0	12.1	6.8	3.3	5.7
128432	19.5	12.3	18.9	11.3	10.9	10.4	16.7
128433	8.1	22.6	28.6	16.7	9.7	5.2	9.1
128434	3.0	25.1	28.4	16.0	7.6	5.1	14.8
AVE.	18.9	21.8	24.1	12.2	6.6	4.5	11.8

VEGETATED SWALE

	Gravel	V. Coarse	Coarse	Medium	Fine	Very Fine	Silts & Clays
Hermon	21.9	14.3	10.2	6.1	5.2	5.3	37.0
Portland	3.9	17.2	30.7	26.0	13.9	5.3	3.0

WET POND

Bridgton	3.2	20.7	45.3	23.4	5.4	1.4	0.6

SAND STOCKPILES

126515	14.9	26.7	41.8	13.7	2	0.5	0.4
128429	19.1	24.7	26.8	12.6	8.4	4.3	4.1